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Is green is the new sexy? Romantic benefits of conspicuous conservation

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ABSTRACT

Conspicuous conservation refers to pro-environmental activities that are intended as signals of some attractive quality of the actor. As some of these qualities are desirable in romantic partners, people may purchase green products or services to impress potential romantic partners. We propose that conspicuous conservation communicates generosity – a trait that is especially valued in long-term romantic partners. Two studies tested whether people's sustainable product preferences influence how they are perceived as romantic partners (Study 1), and whether actual product preferences are aligned with these perceptions (Study 2). Results from Study 1 suggest that people presented as having purchased green products are perceived as more generous and more attractive as long-term – but also short-term – romantic partners. Results from Study 2 suggest that individuals primed to think about a romantic context are no more likely to prefer sustainable products, suggesting an actor-observer discrepancy that potentially adds to the honesty of the conspicuous conservation signal. The potential communicative value of conspicuous conservation is discussed in relation to the literature on costly signaling, sexual selection, and green marketing.

1. Introduction

Twenty-one years ago, Toyota introduced the first mass-produced hybrid car to the world: the Prius. Toyota's environmentally-friendly models quickly became leaders in the market, with the Prius line accounting for 40.8% of total hybrid car sales in the U.S. from 2000 to 2016 (Cobb, 2016). Electric vehicles gained even more popularity recently, with market leaders such as Tesla aiming to sell one million cars annually (Cazzola, Gorner, Schuitmaker, & Maroney, 2017). Both Toyota and Tesla have succeeded in making luxurious environmentally-friendly cars appealing to the public. But why do people find these products so appealing? One potential answer to this question is that an environmentally friendly car "shows the world that its owner cares" (Maynard, 2007). In the present investigation, we explore the communicative value of sustainable products and the benefits they provide in a common type of social interaction: romantic relationships.

1.1. Costly signaling theory and conspicuous consumption

Scholars have long wondered why people spend large sums of money on luxurious products. To illuminate this phenomenon, Veblen (1899) introduced the concept of conspicuous consumption – the act of spending money on expensive goods and services to advertise one's wealth and social class. Since then, a plethora of research has tried to better understand conspicuous consumption (e.g., Griskevicius, Tybur, & Van den Bergh, 2010; Nelissen & Meijers, 2011; Sexton & Sexton, 2014). Studies have indicated that people consume conspicuously to express their identities (Berger & Heath, 2007), and that luxury brands can signal value-expressive information more readily than regular ones (Bearden & Etzel, 1982). Complementing these points, research conducted using a costly signaling framework has focused in understanding the ultimate explanations behind these type of product purchases (Miller, 2010). This work has highlighted the sex-specific fitness-relevant benefits reaped through conspicuous consumption (Van Vugt, Griskevicius, & Schultz, 2014). Costly signaling theory posits that organisms develop costly traits to signal qualities that are not directly observable to potential mates (Miller, 2000, 2010; Zahavi & Zahavi, 1977). When applied to humans, this theory suggests that conspicuous consumption could serve as a communicative signal of socially relevant underlying qualities possessed by the signaler (Miller, 2000, 2010), and highlights the sex-specific fitness-relevant benefits that can be reaped

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through engaging in this type of consumption (Van Vugt et al., 2014).

1.2. Conspicuous consumption and short-term mate attraction

Communicating via costly signals can provide advantages in many types of social relationships (for an example, see Berger, 2017), including romantic relationships. Previous research is consistent with the hypothesis that one function of conspicuous consumption is to attract sexual partners (Griskevicius et al., 2007). Given that mate search and acquisition is costly in terms of time, energy, and resources, natural selection favors mechanisms that detect and motivate attraction toward individuals who would be relatively high quality and compatibility partners (Buss & Schmitt, 1993; Miller & Todd, 1998). Some mate qualities are roughly equally desirable for men and women (e.g., kindness, good health, humor) (Buss & Schmitt, 2019); others are preferred much more by one of the sexes. In particular, due to differences between the sexes in minimal obligate parental investment – with women's minimum investment being larger than men's (Trivers, 1972) – women on average prioritize having a partner with resources more than men do when looking for a mate (Bech-Sørensen & Pollet, 2016; Buss, 1998; Buss & Schmitt, 1993). Therefore, men can benefit from signaling their wealth and social status to potential mates more so than women. Indeed, previous research suggests that men – but not women – are more willing to spend money on conspicuous goods – but not in basic amenities – when mating goals are salient (Griskevicius et al., 2007). Research has further suggested that conspicuous consumption advertises qualities that are more desirable for a short-term relationship than a long-term relationship. In a series of experiments, Sundie et al. (2011) reported that sociosexually unrestricted men (e.g., men that are more willing to engage in casual and uncommitted sex; Simpson & Gangestad, 1991), when primed with a short-term mating motive, preferred more expensive and flashy clothes and accessories (e.g., Ralph Lauren shirt; $139, Tag Heuer watch; $1.990) than did more sociosexually restricted men. Results also indicated that women rated men engaging in conspicuous consumption as more sociosexually unrestricted and more desirable as short-term relationship partners, but not long-term ones. That said, could the purchase of conspicuous product also allow potential partners to advertise qualities that are important for long-term romantic relationships?

1.3. Conspicuous conservation and long-term relationships

A sustainable form of conspicuous consumption, which is often referred to as conspicuous conservation (Sexton & Sexton, 2014), can also serve as a costly signal, with potentially multiple communicative functions. Both costly signaling theory (Arnocky, Piché, Albert, Ouellette, & Barclay, 2017; Barclay, 2010; Barclay & Willer, 2007; Bhogal, Farrelly, Galbraith, Manktelow, & Bradley, 2020; Griskevicius et al., 2010) and indirect reciprocity theory (Leimar & Hammerstein, 2001) suggest that particular kinds of pro-social, pro-environmental behaviors serve as costly signals. For instance, buying an expensive hybrid car not only shows that the purchaser can afford such a vehicle, but also that he or she cares about the environment. For this reason, researchers have proposed that conspicuous conservation not only communicates status, but also prosociality (Berger, 2017; DiDonato & Jakubiak, 2016; Gintis, Smith, & Bowles, 2001).[1]

Based on these considerations, we hypothesize that conspicuous conservation signals qualities desirable in long-term romantic partners. The mate qualities preferred in long-term partners are, to an extent, different from those prioritized in short-term partners (Buss & Schmitt, 2019). In particular, both men and women value kindness and generosity more so in long-term partners than in short-term ones (Stewart-Williams & Thomas, 2013). Indeed, regardless of their sex, people tend to find others that behave in an altruistic fashion more attractive for long-term romantic relationships (Barclay, 2010), and self-reported altruism predicts self-reported mating success of both men and women (Arnocky et al., 2017). Importantly, existing work suggests that conspicuous conservation communicates not only social status (as conspicuous consumption does), but also prosocial qualities. Regarding social status, because sustainable conspicuous products are usually more expensive their non-sustainable counterparts, they should be perceived as status-enhancing. Indeed, literature shows that individuals that display more restraint in using communal resources are considered as more prestigious than more wasteful individuals (DiDonato & Jakubiak, 2016; Hardy & van Vugt, 2006; Van Vugt & Hardy, 2009), and that people perceive conspicuous consumers of sustainable products as having higher social status than consumers of non-sustainable products (Braun Kohlová & Urban, 2020; DiDonato & Jakubiak, 2016).

Regarding long-term mate qualities, other literature suggests that the self-sacrificing aspect of conspicuous conservation conveys cues about people's trustworthiness (Berger, 2017; DiDonato & Jakubiak, 2016). For instance, research suggests that public displays of pro-social behavior (i.e., generosity) increase perceptions of trustworthiness in social dilemma games (Klapwijk & Van Lange, 2009), and that people who make sustainable consumption decisions are trusted more in an incentivized trust dilemma game (Berger, 2019). Additional literature shows that consumption of sustainable products leads to higher perceptions of altruism (Braun Kohlová & Urban, 2020; Puska, 2018), and that individuals engage in altruism partially to signal traits indicative of long-term mate quality to potential opposite-sex partners (Phillips, Barnard, Ferguson, & Reader, 2008).

Research has also shown that people prefer altruistic traits more for potential long-term romantic partners than for short-term partners, and that this difference is larger for women's preferences (Bhogal, Farrelly, & Galbraith, 2019; Bhogal, Galbraith, & Manktelow, 2018). That said, most findings suggests that both sexes have higher standards when selecting a long-term mate relative to a short-term one, and both value altruistic traits in potential mates (Arnocky et al., 2017; Barclay, 2010; Bhogal et al., 2019; Farrelly, 2013; Farrelly & King, 2019; Stewart-Williams & Thomas, 2013). Indeed, recent findings indicate that both men and women are more attracted to potential mates who engage in green conspicuous consumption than they are to potential mates who engage in conventional forms of conspicuous consumption like buying an expensive energy inefficient sports-car (DiDonato & Jakubiak, 2016; but see; Borau, Elgaaied-Gambier, & Barbarossa, 2020).

1.4. Present research

In sum, while existing work suggests that conspicuous consumption enhances desirability as a potential romantic partner, only very few studies have examined the effects of conspicuous conservation on partner desirability (e.g., Borau et al., 2020; DiDonato & Jakubiak, 2016). Here, we test how targets described as having purchased sustainable versus conventional products vary in their perceived attractiveness; we further test whether any effects are moderated by observer sex (man/woman) and product price (high/low). We use an approach that addresses some methodological shortcomings from previous research (e.g., Borau et al., 2020; DiDonato & Jakubiak, 2016; Sundie et al., 2011). First, following recommendations of past studies (i.e., DiDonato & Jakubiak, 2016), we present participants with more varied products than those used in previous research (e.g., car and dishwasher; DiDonato & Jakubiak, 2016). Second, instead of only describing a product purchase decision made by an unseen buyer – which, to our knowledge is the most common, if not the only, method previous studies

[1] It could also be argued that, instead of purchasing conspicuous sustainable products (i.e., a hybrid car), a person could engage in conspicuous conservation by buying fewer products in general and be outspoken about it (e.g., conspicuous minimalism). However, recent research has failed to find an association between consumer minimalism and biospheric motivations (Herziger, Berkessel, & Steinnes, 2020).

have used to manipulate perceptions of green purchasers – we present participants with a picture of the purchaser. Leaving the buyer unseen might confound purchase information with purchaser appearance if, for example, green-product purchasers are pictured as differing from conventional-product purchasers in age, ethnicity, or social class. And third, building on suggestions from previous research (i.e., Borau et al., 2020), we compare the effects of purchase decisions of green products to not only luxury conventional alternatives but also to less expensive conventional alternatives.

Based on theory and previous findings, we predicted that (1) both men and women would find opposite-sex individuals who buy sustainable products more desirable as long-term mates than those who buy conventional products. We also predicted that people who make sustainable product choices would not be more desirable as short-term mates. Further, we expected that the effect of product sustainability on long-term desirability would occur only when the green products are relatively expensive (cf. Griskevicius et al., 2010). Furthermore, we predicted that (2) buying relatively expensive conventional products would increase the desirability of male buyers – but not female buyers – as short-term mates, and that, in line with previous work (Sundie et al., 2011), (3) relatively expensive conventional products would increase the perceived sociosexuality (SOI – the extent to which a person is willing to engage in casual and uncommitted sex; Simpson & Gangestad, 1991) of male buyers, but not female buyers. Finally, we expected (4) green buyers to be perceived as more generous than buyers of conventional products, and (5) buyers of relatively expensive products to be perceived as wealthier than buyers of relatively cheap products.

In a second study, we tested whether people prefer to buy green products more when they are put in a mating context (i.e., when they are asked to imagine to have a date). Some previous literature is seemingly consistent with this idea. Sundie et al. (2011) reported that sociosexually unrestricted men, when primed with a mating motive, chose to spend more fictituous money on conspicous products and services than on less conspicous ones. Similarly, Griskevicius et al. (2007) found that a mating motive prime was associated with greater intentions to (1) be financially generous (e.g., buying dinner for a homeless family who approach them when they are leaving a restaurant with a group of friends), and (2) heroically help others (e.g. confront two armed burglars who are robbing a house) (though only among sociosexually unrestricted men). These patterns only applied to men, though; for women, mating motives were instead associated with desires to spend more when consumption was generous or helpful, and it was made publicly. Thus, we predicted that (1) men's sociosexuality – but not women's – would negatively relate to preferences for buying sustainable products, and positively relate to preferences for expensive products, and that (2) relations between men's sociosexual orientation on consumer preferences would exist only when mating motives are salient.

2. Study 1

2.1. Materials and methods

2.1.1. Participants

Based on previous findings, a power analysis conducted in G*Power using an alpha of .05, a power of .90, and a conservative estimation of a small effect size ($f = 0.14$), suggested a sample size of N = 520. However, to account for exclusions due to sexual orientation (i.e. participants not being attracted to the opposite sex -around 4.5% of U.S population), and inattentive responses, we aimed for a sample size of 570 participants. We used Prolific Academic to collect five-hundred-seventy single American adults aged between 18 and 35 years old (51.6% males; M_{age} = 25.23 years, SD_{age} = 5.00 years) as research suggests that mating-related motives likely peak at young adult ages (Neel, Kenrick, White, & Neuberg, 2016). We excluded sixty-one participants indicating that they were not attracted to the opposite-sex and twenty-six individuals who did not pass the attention checks. The final sample size was 483 participants (53.4% males; M_{age} = 25.16 years, SD_{age} = 4.97 years).

2.1.2. Design

This study followed a 2 (Participant sex: female vs. male – between-subjects) x 2 (Relative purchase price: less expensive vs. more expensive than the average – within-subjects) 2 × (Consumption type: non-green consumption vs. green consumption – within-subjects) mixed design. Participants rated the short- and long-term attractiveness of an opposite-sex individual who was described as having purchased one version (green vs. non-green X expensive vs. non-expensive) of each of 12 types of products. Study materials, analyses syntax, data, and pre-registered hypotheses are available on the Open Science Framework (OSF): osf.io/6pevj.

2.1.3. Procedure

After providing informed consent, participants were told that they would participate in a study about romantic choices. They were then told that they would see images and read information about opposite-sex targets, and that they would rate those targets on several dimensions. Participants were presented with 12 pictures of opposite-sex targets, each of whom was randomly paired with a different product and described as having purchased that product (see Appendix A). Each product description conveyed sustainability (green versus conventional) and price (less expensive versus more expensive than the product's average market price). All information was based on real products. Target pictures were selected from the Chicago Face Database (Ma, Correll, & Wittenbrink, 2015; Appendix B), and male and female faces were matched in terms of average attractiveness. Participants rated each target on generosity (0 = "Not at all generous" to 6 = "Very generous"), wealth (0 = "Not at all wealthy" to 6 = "Very wealthy"), desirability as a short-term mate (a fling; 0 = "Not at all desirable" to 6 = "Very desirable"), and desirability as a long-term mate (marriage and/or steady dating; 0 = "Not at all desirable" to 6 = "Very desirable"). Then, following Sundie et al. (2011), participants rated the target's sociosexual orientation by estimating the extent to which the target would be comfortable and enjoy having "casual" sex with different partners (0 = "Not at all" to 6 = "Very much"). Finally, participants reported their age, sexual orientation, and whether they were currently in a relationship (yes or no), and they completed attention check tasks (involving one simple counting task and an open-ended question to evaluate attention and English literacy). Finally, they were debriefed and thanked for their participation.

3. Results

3.1. Analytical strategy for model specification

We followed recommendations from Bates, Kliegl, Vasishth, and Baayen (2018) for model specification using linear mixed models. As pre-registered, perceptions of generosity, wealth, and sociosexuality were separately regressed on (1) participant sex, (2) product price (less expensive versus more expensive), and (3) product greenness (green versus conventional), and on all possible interactions between these variables. Desirability ratings, besides being regressed on all the previously mentioned factors, were also regressed on relationship context (short-versus long-term). Random intercepts for participants, products, and faces[2] were estimated for all models, and all possible random slopes for main effects and interactions were initially included as random

[2] The preregistered analysis plan did not indicate that faces would be included as random intercept. This was a mistake, and given that faces' attractiveness might affect desirability ratings, we decided to include this variable in the actual analysis. Also, due to an error in the survey programming, fifteen participants saw a target face more than once. The trails in which participants saw repeated faces were excluded from the analyses.

terms. When needed, random effects were removed to arrive at more parsimonious (and converging) models. Details regarding model-reduction processes can be found in Appendix C. Similarly, summaries of random intercept and slope variances are presented in Table 1C of Appendix C. We used the lmer function of the lme4 package (Bates, Mächler, Bolker, & Walker, 2015) for R software environment for statistical computing (version 3.6.1; R Core Team, 2019). All models were initially fitted by restricted maximum likelihood (REML), and refitted by maximum likelihood (ML) whenever necessary (i.e. when comparing models via likelihood ratio tests). Satterthwaite approximation for degrees of freedom are reported below.

3.2. Buyers' perceived generosity

We predicted that buyers of green products would be perceived as more generous than buyers of conventional ones. Results were in line with this prediction, $M_{green} = 4.49$, $SE_{green} = 0.06$; $M_{conventional} = 3.94$, $SE_{conventional} = 0.05$. However, the main effect of product greenness, $F(1, 15.8) = 118.50$, $p < .001$, was qualified by interactions with participant sex, $F(1, 477.6) = 9.83$, $p = .001$, and product price, $F(1, 5186.1) = 5.01$, $p = .025$. Simple effect tests revealed that green purchasers were viewed as more generous than conventional purchasers when products were both less expensive, $M_{green} = 4.42$, $SE_{green} = 0.06$; $M_{conventional} = 3.92$, $SE_{conventional} = 0.06$, $p < .001$, and more expensive, $M_{green} = 4.56$, $SE_{green} = 0.06$; $M_{conventional} = 3.95$, $SE_{conventional} = 0.06$, $p < .001$. Similarly, male purchasers of green products, $M = 4.52$, $SE = 0.07$, were viewed as more generous than male purchasers of conventional products, $M = 3.87$, $SE = 0.06$, $p < .001$, and female purchasers of green products, $M = 4.46$, $SE = 0.07$, were rated as more generous than female purchasers of conventional ones, $M = 4.00$, $SE = 0.06$, $p < .001$ (see Table 1 for unstandardized regression coefficients and confidence intervals of fixed effects).[3]

Table 1
Fixed effects of participant sex, product greenness, and product price on buyers' perceived generosity.

Fixed effects	Buyers' perceived generosity				
	b	*SE*	95% *CI*	*t*	*p*
(Intercept)	4.21	0.05	4.11–4.32	80.61	<0.001
Participant sex	0.02	0.04	−0.06–0.10	0.45	0.657
Product greenness	−0.28	0.03	−0.33–−0.23	−10.89	<0.001
Product price	−0.04	0.02	−0.08–−0.00	−2.06	0.040
Participant sex x Product greenness	0.05	0.02	0.02–0.08	3.14	0.002
Participant sex x Product price	0.03	0.02	−0.01–0.07	1.25	0.212
Product greenness x Product price	0.03	0.01	0.00–0.05	2.24	0.025
Participant sex x Product greenness x Product price	0.01	0.01	−0.02–0.03	0.40	0.686

Note: The reference category for participant sex is male, for product greenness is non-green, and for product price is cheap.
b: unstandardized regression coefficient, *SE*: standard error, *CI*: 95% confidence intervals.

[3] Given that there is currently no agreement on how standardized effect sizes for individual model terms (main effects and interactions) should be calculated when using linear mixed models (Rights & Sterba, 2019), we follow general recommendations for reporting effect sizes (Pek & Flora, 2018) and report unstandardized effect sizes (i.e., unstandardized beta coefficients) for this and subsequent models.

3.3. Buyers' perceived wealth

We predicted that buyers of more expensive products would be perceived as wealthier than buyers of less expensive products. Again, results were consistent with this prediction, $F(1, 13.1) = 83.90$, $p < .001$, $M_{expensive} = 4.83$, $SE_{expensive} = .11$; $M_{less\ expensive} = 3.73$, $SE_{less\ expensive} = .08$. This predicted main effect was moderated by product greenness, $F(1, 5165.8) = 31.76$, $p < .001$. Simple effect tests showed that purchasers relatively more expensive green products, $M = 4.82$, $SE = 0.11$, were viewed as wealthier than purchasers of relatively less expensive green ones, $M = 3.85$, $SE = 0.08$. Similarly, relatively more expensive conventional products purchasers, $M = 4.84$, $SE = 0.11$, $p <. 001$, were rated as wealthier than purchasers of relatively less expensive conventional products, $M = 3.62$, $SE = 0.08$, $p <. 001$. Additionally, we observed an unexpected interaction between participant sex and product greenness, $F(1, 451.8) = 7.36$, $p = .006$. Simple effect tests revealed that male green product purchasers, $M = 4.42$, $SE = 0.10$, were viewed as wealthier than male conventional product purchasers, $M = 4.25$, $SE = 0.10$, $p <. 001$, but female green produce purchasers were rated no differently from female conventional product purchasers ($M = 4.25$, $SE = 0.07$ versus $M = 4.21$, $SE = 0.07$, respectively; $p = .357$; see Table 2 for unstandardized regression coefficients and confidence intervals of fixed effects).

3.4. Buyers' perceived sociosexuality

We predicted that more expensive non-green products would increase the perceived sociosexuality of male, but not female, buyers – that is, a three-way interaction between participant sex, product greenness, and product price. Results did not support this prediction, $F(1, 5300.9) = 1.62$, $p = .202$. Instead, results showed a two-way interaction between participant sex and product price, $F(1, 5306.5) = 8.08$, $p = .004$, and a two-way interaction between participant sex and product greenness, $F(1, 45.6) = 4.88$, $p = .032$. Regarding the former, simple effect tests showed that male purchasers were viewed as more sociosexually unrestricted when they bought more expensive products, $M = 4.43$, $SE = 0.09$, than when they bought less expensive ones, $M = 4.16$, $SE = 0.09$, $p < .001$. In contrast, female purchasers were rated equivalently across more expensive, $M = 3.73$, $SE = 0.10$, and less expensive products, $M = 3.62$, $SE = 0.10$, $p = .139$. Similarly, while male purchasers were viewed as more sociosexually unrestricted when they bought conventional products, $M = 4.41$, $SE = 0.09$, than when they bought green ones, $M = 4.19$, $SE = 0.09$, $p < .001$, female purchasers who bought green, $M = 3.64$, $SE = 0.09$, and conventional products, $M = 3.72$, $SE = 0.10$, were

Table 2
Fixed effects of participant sex, product greenness, and product price on buyers' perceived wealth.

Fixed effects	Buyers' perceived wealth				
	b	*SE*	95% *CI*	*t*	*p*
(Intercept)	4.28	0.08	4.12–4.44	52.58	<0.001
Participant sex	−0.05	0.03	−0.12–0.02	−1.43	0.155
Product greenness	−0.05	0.02	−0.08–−0.02	−3.36	0.005
Product price	−0.55	0.06	−0.66–−0.43	−9.16	<0.001
Participant sex x Product greenness	0.03	0.01	0.01–0.06	2.71	0.007
Participant sex x Product price	0.04	0.02	−0.00–0.08	1.96	0.051
Product greenness x Product price	−0.07	0.01	−0.09–−0.04	−5.64	<0.001
Participant sex x Product greenness x Product price	−0.00	0.01	−0.02–0.02	−0.01	0.995

Note: The reference category for participant sex is male, for product greenness is non-green, and for product price is cheap.
b: unstandardized regression coefficient, *SE*: standard error, *CI*: 95% confidence intervals.

rated as equally sociosexually unrestricted, $p = .08$ (see Table 3 for unstandardized regression coefficients of fixed effects).

In sum, men (but not women) were perceived as more sociosexually unrestricted if they bought more expensive products (regardless of product type) and if they bought conventional products (regardless of product price) (Fig. 1).

3.5. Buyers' desirability as a romantic partner

We predicted that product greenness would increase the desirability of purchasers as long-term mates, but not as short-term ones, and that such increased desirability would not differ between sexes. Results partially supported this hypothesis, showing a two-way interaction between product greenness and relationship context, $F(1, 10015.9) = 26.01$, $p < .001$. Simple effect tests revealed that purchasers were viewed as more desirable as long-term partners when they bought green, $M = 3.89$, $SE = 0.10$, than when they bought conventional products, $M = 3.59$, $SE = 0.10$, $p < .001$. However, purchasers were also rated as more desirable as short-term partners when they bought green products, $M = 3.76$, $SE = 0.10$, than when they bought conventional ones, $M = 3.68$, $SE = 0.10$, $p = .03$ (Fig. 2). In other words, the effect of products' greenness appeared across relationship contexts, but was stronger for long-term relationships. Based on past findings (Griskevicius et al., 2010) we predicted this interaction to be further moderated by product price. Results did not support this prediction, $F(1, 10020.3) = 1.16$, $p = .279$.

We also predicted that more expensive conventional products would increase the desirability of male buyers – but not female buyers – as short-term mates, conceptually replicating previous work (Sundie et al., 2011). Consistent with this prediction, results showed a three-way interaction between relationship context, product price, and participant sex, $F(1, 10004.1) = 5.84$, $p = .015$. This interaction, however, was not moderated by product greenness $F(1, 10020.3) = 1.00$, $p = .316$. The three-way interaction was broken down to test how relationship context and product price influenced desirability ratings for male and female purchasers, separately. Simple effect tests showed that female purchasers were viewed as more desirable as long-term partners when they bought less expensive products, $M = 3.79$, $SE = 0.17$, than when they bought more expensive ones, $M = 3.60$, $SE = 0.16$, $p = .001$. Male purchasers were rated similarly when they bought less expensive, $M = 3.81$, $SE = 0.11$, versus more expensive products, $M = 3.77$, $SE = 0.11$, $p = .63$. Regarding short-term desirability, male and female purchasers were rated equally when they bought less expensive products, $M_{\text{male purchasers}} = 3.68$, $SE_{\text{male purchasers}} = .11$; $M_{\text{female purchasers}} = 3.69$, $SE_{\text{female purchasers}} = .17$, and when they bought more expensive ones, $M_{\text{male purchasers}} = 3.73$, $SE_{\text{male purchasers}} = .11$, $p = .45$; $M_{\text{female purchasers}} = 3.78$, $SE =_{\text{female purchasers}} = .16$, $p = .16$ (see Table 4 for unstandardized regression coefficients and confidence intervals of fixed effects).

In sum, purchasers (regardless of their sex) were perceived as more desirable as long term and short-term partners if they bought green products (regardless of product price). Also, female (but not male) purchasers were viewed as more desirable as long-term partners if they bought less expensive products (regardless of product greenness) (Fig. 2).

Table 3
Fixed effects of participant sex, product greenness, and product price on buyers' perceived sociosexuality.

Fixed effects	Buyers' perceived sociosexuality				
	b	*SE*	95% *CI*	*t*	*p*
(Intercept)	3.99	0.07	3.86–4.12	59.30	<0.001
Participant sex	−0.31	0.06	−0.43–−0.19	−4.97	<0.001
Product greenness	0.07	0.02	0.04–0.11	4.56	<0.001
Product price	−0.09	0.03	−0.16–−0.03	−2.74	0.019
Participant sex x Product greenness	−0.04	0.02	−0.07–−0.00	−2.21	0.032
Participant sex x Product price	0.04	0.01	0.01–0.07	2.84	0.004
Product greenness x Product price	−0.02	0.01	−0.04–0.01	−1.15	0.251
Participant sex x Product greenness x Product price	0.02	0.01	−0.01–0.05	1.27	0.203

Note: The reference category for participant sex is male, for product greenness is non-green, and for product price is cheap.
b: unstandardized regression coefficient, *SE*: standard error, *CI*: 95% confidence intervals.

4. Discussion

Based on costly signaling theory and findings on conspicuous consumption (Griskevicius et al., 2010; Miller, 2000, 2010; Sundie et al., 2011), we formulated a number of predictions regarding the communicative value of different product purchases. Overall, results suggest that, compared to people who buy conventional products, those who buy sustainable products are perceived as more generous. Further, green consumption appears to increase desirability of both men and women as long-term partners, and to a lesser extent, short-term ones. Additionally, results suggest that observers infer information about a person's sociosexuality (i.e., openness to sex outside of a committed relationship) from their consumption preferences. In particular, women perceive men as more sociosexually unrestricted when they purchase relatively more expensive (versus relatively less expensive) products (replicating previous work by Sundie et al., 2011), and when they purchase conventional (versus green) products.

From an actor's perspective rather than an observer's perspective, these results suggest that people might engage in certain types of consumption in order to signal relevant information about themselves and that such signaling could vary as a function of sociosexuality. Indeed, as mentioned earlier, previous literature suggests that men's – but not women's – sociosexuality influences consumption decisions especially when mating motives are salient (Griskevicius et al., 2007; Sundie et al., 2011). Thus, these previous studies suggest the influence of mating orientation on consumption preferences – if any – would occur only among men, and that contextual motives should trigger such effects.

To our knowledge, no study has yet explored whether mating orientations and contextual (i.e. mating) motives influence people's consumption of sustainable products in particular. We tested this idea in Study 2 using a conjoint approach, which is commonly used to study consumer preferences in market research (Hair, Black, Babin, Anderson, & Tatham, 2006).

5. Study 2

5.1. Materials and methods

5.1.1. Participants

The recommended minimum sample size to conduct a conjoint analysis for confirmatory research (as opposed to exploratory work for hypotheses development about the market) is about 300 participants (Orme, 2010). However, as our main aim here is to test whether the interaction between mating motives, participants' sex, and sociosexuality predicts the relative importance of products' green features, and cheapness, we conducted a power analysis in G*Power. Although previous literature suggests a relatively large interactive effect (i.e., $f = 0.40$; Griskevicius et al., 2007) between mating motives, sociosexual orientation and sex on related outcomes such as financial generosity, recent work suggests that published effect sizes of mating motive primes on consumer behavior are likely inflated due to publication bias (Shanks et al., 2015; Shanks & Vadillo, 2019). We thus estimated a small effect size ($f = 0.14$). With this effect size estimate, and using an alpha of .05, and power of .90, the projected sample size needed to detect a three-way interaction between sociosexual orientation, mating motives, and participant sex was N = 539. However, given around 17% of Study 1

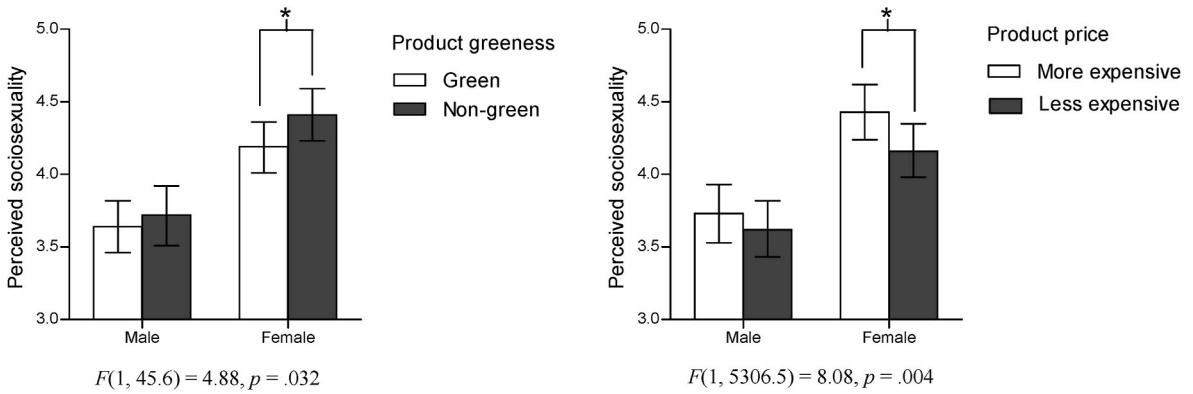

Fig. 1. Means and 95% confidence interval bars for male and female perceived SOI depending on product greenness and product price. * indicates that the simple effect is significant at the $p < .05$ level.

Fig. 2. Means and 95% confidence interval bars for short and long-term desirability ratings of buyers depending on the product greenness. * indicates that the simple effect is significant at the $p < .05$ level.

participants were excluded because they did not pass the attention check, or were not attracted to opposite-sex individuals, we aimed to collect 631 participants. We again used Prolific Academic to recruit participants. We used the service's prescreen feature to recruit only single heterosexual American adults aged between 18 and 35 years old. Despite this screen, 22 participants out of 634 recruited (59% males; M_{age} = 24.70 years, SD_{age} = 4.66 years) reported having a non-heterosexual orientation, and therefore were excluded from the analyses. Similarly, eight participants did not pass the attention check and were also excluded from the analyses. Thus, the final sample was 605 participants (59.7% males; M_{age} = 24.76 years, SD_{age} = 4.68 years).

5.1.2. Design

The study followed a 2 × (Product greenness: conventional vs. green – within-subjects) 2 × (Product price: less expensive than average vs. more expensive than average – within-subjects) x 2 (Sex: men vs. women – between-subjects) x 2 (Motive: mating vs. control – between-subjects) mixed design. Participants rated how likely is that they would buy 48 products (varying in terms of price and greenness) if they were shopping for them. Study materials, analyses syntax, data, and pre-registered hypotheses are available on the OSF: osf.io/f35gz.

5.1.3. Procedure

5.1.3.1. Conjoint design. We investigated the relative importance of product price and product greenness via a conjoint approach (Hair et al., 2006). Conjoint analysis is a multivariate and decomposing statistical technique that allows the study of consumer preferences or (purchase) decisions in a relatively realistic setting (Green, Krieger, & Wind, 2001; Green & Srinivasan, 1978). The conjoint measurement approach is usually regarded as a more suitable research method to study consumer preferences and purchase decisions than others (e.g., surveys) because it emulates the trade-offs faced by consumers when deciding between different product attributes (Green et al., 2001). Thus, by presenting consumers with different hypothetical products varying in a number of attributes, instead of examining how individual attributes affect consumer preferences independently, conjoint analysis studies the

Table 4
Fixed effects of participant sex, product greenness, relationship context, and product price on buyer's desirability as a romantic partner.

Fixed effects	Buyers' desirability				
	b	*SE*	95% *CI*	*t*	*p*
(Intercept)	3.73	0.10	3.54–3.93	37.41	**<0.001**
Participant sex	−0.02	0.10	−0.20–0.17	−0.17	0.865
Product greenness	−0.10	0.02	−0.13–−0.06	−5.49	**<0.001**
Relationship context	−0.01	0.01	−0.04–0.02	−0.80	0.422
Product price	0.01	0.02	−0.03–0.05	0.54	0.593
Participant sex x Product greenness	0.03	0.02	−0.00–0.06	1.77	0.083
Participant sex x Relationship context	0.03	0.01	0.00–0.06	2.20	**0.029**
Product greenness x Relationship context	0.05	0.01	0.03–0.07	5.10	**<0.001**
Participant sex x Product price	0.02	0.02	−0.02–0.05	0.89	0.375
Product greenness x Product price	0.02	0.01	−0.01–0.04	1.45	0.146
Relationship context x Product price	−0.04	0.01	−0.06–−0.02	−4.32	**<0.001**
Participant sex x Product greenness x Relationship context	−0.02	0.01	−0.04–0.00	−1.57	0.117
Participant sex x Product greenness x Product price	−0.00	0.01	−0.02–0.02	−0.03	0.980
Participant sex x Relationship context x Product price	−0.02	0.01	−0.04–−0.00	−2.42	**0.016**
Product greenness x Relationship context x Product price	−0.01	0.01	−0.03–0.01	−1.08	0.280
Participant sex x Product greenness x Relationship context x Product price	−0.01	0.01	−0.03–0.01	−1.00	0.317

Note: The reference category for participant sex is male, for product greenness is non-green, for relationship context is short-term, and for product price is cheap. *b*: unstandardized regression coefficient, *SE*: standard error, *CI*: 95% confidence intervals.

importance of different product qualities in consideration to other features of the product. In other words, conjoint analysis enables the estimation of the relative importance of a finite set of product attributes (and their levels) on preferences for a hypothetical product (or the "utility") (Hair et al., 2006). Importantly, the different combinations of product attributes (e.g. size) and levels (e.g., big vs. small) create a number of stimulus profiles, which are then presented to consumers to be evaluated.

Depending on the preference model used, the conjoint analysis assumes different composition rules for utility estimates (for a revision see Green & Srinivasan, 1978). That is, how different attributes would relate to utility values. In this study, the most commonly used model in marketing and consumer research was used: the part worth model. The rationale for model selection was based on the higher flexibility of part worth model in comparison to alternative ones, and on the fact that quantitative attributes were not be present in our conjoint design (Arning, 2017). The part worth function model assumes that the overall utility of a product (e.g., buying likelihood, purchase decision) is the sum of the part worth scores of relative importance derived for each of the attribute levels of it.

Conjoint analysis can be carried out following a number of approaches (e.g., choice-based, trade-off, full-profile). In the present study, a full profile rating approach was used. In the full profile approach, consumers are presented with all product alternatives (all the combinations of attribute levels) and asked to either rank or rate them according to their preferences. Moreover, the full profile approach (either based on ratings or ranking) estimates individual part worth scores per participant, allowing further analysis of such data (e.g., consumer segmentation) (Rao, 2014).

5.1.3.2. Mating motives, SOI, and consumer preferences. After providing informed consent, participants were told that they would participate in a study with two parts. In the first part, participants completed the three attitudinal questions from the Revised Sociosexual Orientation Inventory ($\alpha = 0.82$; Penke & Asendorpf, 2008). Given that agreeableness, honesty-humility, and conscientiousness are associated with both sociosexuality (Banai & Pavela, 2015; Bourdage, Lee, Ashton, & Perry, 2007; Strouts, Brase, & Dillon, 2017), and environmentalism (Brick & Lewis, 2014; Desrochers, Albert, Milfont, Kelly, & Arnocky, 2019; Hilbig, Zettler, Moshagen, & Heydasch, 2012; Hirsh, 2010), participants also completed measures of these traits (agreeableness $\alpha = 0.78$, conscientiousness $\alpha = .78$, and honesty-humility $\alpha = 0.73$; HEXACO-60 Ashton & Lee, 2009). The presentation order of the items measuring these constructs was random. Next, to manipulate the salience of mating motives, we followed Griskevicius et al. (2007; Study 1) and presented half of the participants with three images depicting attractive opposite-sex individuals. The pictures were selected from the Chicago Face Database (Ma et al., 2015; Appendix E). Male and female pictures were matched in terms of attractiveness. Participants were asked to select the one they found most desirable as a romantic partner. Then, they were asked to imagine a first date with that person and to write a short paragraph (around 100–150 words) about what a perfect date with this person would be like. In the control condition, the rest of the participants were presented with three colored blocks (i.e., orange, yellow, and gray). They were asked to select the block they prefer the most and to write a short paragraph (also around 100–150 words) describing why do they prefer that color.

Next, participants were thanked for their participation in the first part of the study and told that they would continue with the second part of the study, which concerned consumer behavior. Participants were asked to imagine that they were shopping for products varying in terms of greenness (conventional vs. sustainable), and price (less expensive than average vs. more expensive than average), and asked how likely they would be to buy each product. As a full profile approach to conjoint analysis was used, participants were asked to rate each of 12 product types (e.g. car, dishwasher, rug, sunglasses, etc.) four times (each time featuring one the four possible combinations of products' attributes; price and greenness). Thus, in total, participants rated 48 products (i.e. stimulus profiles), which were presented in a random order (Appendix D). After rating all the products, participants reported their age, sexual orientation, whether they are currently in a relationship (yes or no), and they completed the same attention check tasks used in Study 1. Finally, they were debriefed and thanked for their participation.

6. Results

6.1. Conjoint analysis

The conjoint model showed adequate reliability, Pearson's $R = 0.84$, $p < .001$. The average buying likelihood of the products (represented by the constant) was 2.81 (on a 5-point scale). Product price was a more important attribute than product greenness in terms of explaining variation in products' buying likelihood, with participants preferring less expensive products (see Table 5). Similarly, sustainable products were evaluated more positively than conventional ones, although the range of this difference is smaller than the one observed for product price.[4]

6.2. Mating motives and SOI, on consumer preferences

Individual-level part worth scores for (1) the higher level of products' greenness (i.e. green) and (2) the higher level of products' price (i.e. more expensive than the average) were regressed on sociosexuality, participant sex, salient motive, and all their interactions via two four-stage hierarchical multiple regressions. Theoretically relevant individual terms (sex, mating motive, and sociosexuality) were included at stage one, followed by their two-way and three interactions in stage two and three, respectively. Then, agreeableness, honesty-humility, and conscientiousness were entered at stage four to control for personality effects.

Prior to the analyses, all predictors were centered, and interaction terms were calculated based on the centered predictors (Cohen, Cohen, West, & Aiken, 2003). Assumptions were met in both regression models. Residuals showed normality and homoscedasticity. Collinearity statistics (tolerance and VIF) fell within accepted limits (tolerance values ranging from 0.780 to 0.918 and VIF values ranging from 1.056 to 1.282). Similarly, Cook's distance values did not alert of significant outliers in any of the models (ranging from 0 to 0.04 for product's greenness, and from 0 to 0.02 for product's price).

The model predicting part worth scores of product greenness, $F(10, 593) = 5.98$, $p < .001$, as well as the model predicting part worth scores

Table 5
Average importance values and average part-worth scores of products' buying likelihood.

Attribute	Average Importance value	Level	Average Part-worth Scores
Product Greenness	27.67	Conventional	-.02
		Green	.02
Product Price	72.15	Less expensive than the average	.59
		More expensive than the average	-.59
		Constant	2.81

[4] Part-worth scores could not be calculated for one participant, who gave the same rating to all stimulus profiles.

of product price, $F(10, 593) = 1.96$, $p = .034$, were significant, though predictors accounted for modest response variance ($R^2_{\text{product greenness}} = .09$; $R^2_{\text{product price}} = .03$). Sociosexuality, $\beta = 0.05$, $SE = 0.01$, $p = .22$, and the mating motive, $\beta = 0.01$, $SE = 0.22$, $p = .70$, did not predict product greenness' part worth scores (see Table 2), but participant sex did, $\beta = 0.20$, $SE = 0.02$, $p < .001$, with women valuing product greenness more than men. We observed no three-way interaction between sociosexuality, participant sex, and salient motive on part worth scores of product greenness, $\beta = 0.01$, $SE = 0.04$, $p = .77$. Of predictors relevant to our predictions, only sociosexuality related to part worth scores of product price, $\beta = -0.10$, $SE = 0.01$, $p = .014$, with more sexually unrestricted participants evaluating more expensive products more negatively than more sexually restricted ones. Participant sex, $\beta = -0.03$, $SE = 0.03$, $p = .37$, and the mating motive, $\beta = 0.03$, $SE = 0.03$, $p = .41$, were unrelated to part worth scores of product price. Also, results did not provide support for our second prediction that men's sociosexuality would positively influence consumer preferences for expensive products, with the three-way interaction between sociosexuality, participant sex, and salient motive failing to reach the significance threshold, $\beta = -0.03$, $SE = 0.06$, $p = .49$.

Lastly, it is worth noting that only one of the covariates – honesty-humility – was a significant a predictor of both product's greenness, $\beta = 0.20$, $SE = 0.01$, $p < .001$, and product's price, $\beta = -0.14$, $SE = 0.03$, $p = .001$, with individuals scoring high in this trait valuing greenness in products more, and evaluating more expensive products more negatively (Table 6 presents further details).

7. Discussion

Based on Study 1, and on previous literature indicating that mating orientation may affect consumption (and financial generosity) under specific conditions (Griskevicius et al., 2007; Sundie et al., 2011), we generated two main predictions: when mating motives were salient, sociosexually unrestricted men would prefer buying expensive conventional products, and sexually restricted ones would prefer buying green products. We tested these predictions using conjoint design that emulates purchase decisions more realistically than other approaches (e.g. surveys; Green & Srinivasan 1990).

First, results from the conjoint analysis indicated that people evaluated less expensive products and green products more positively than more expensive, and conventional ones, respectively. Findings also indicated that price was more important in determining products' buying likelihood than greenness. Our specific predictions about the influence of sociosexuality, mating motives and sex on consumer preferences were largely not supported by the data. Evaluations of product greenness were only influenced by participant sex. Consistent with previous research on sex differences on sustainable consumption (Brough, Wilkie, Ma, Isaac, & Gal, 2016), and with sex differences in environmentalism more generally (Arnocky & Stroink, 2010; Zelezny, Chua, & Aldrich, 2000), women valued products' sustainability more than men. Similarly, evaluations of product price were only predicted by sociosexuality. However, contrary to our expectations, sexually unrestricted individuals evaluated expensive products more negatively than sexually restricted ones.

8. General discussion

Based on evolutionary psychology approaches to mating and consumer decision-making, we generated a number of predictions regarding the communicative value of sustainable product purchases from both the perspective of the perceiver and the actor. We tested these predictions across two studies. Study 1 tested whether people perceive purchasers differently on the sex of the purchasers, the type of product being purchased, and its price. Study 2 tested whether consumers strategically (albeit not necessarily consciously) purchase certain products based on their preferred mating orientation, their sex, and on whether mating cues are salient.

In Study 1, we predicted that purchases of green products (relative to conventional ones), and more expensive products (relative to less expensive ones), would increase perceptions of buyers' generosity and wealth, respectively. Results supported these predictions. Regarding perceived generosity, participants rated buyers who bought green products as more generous than buyers who bought conventional products, and this occurred when the products were both less and more expensive than the average. In a similar vein, and consistent with previous findings on green buyers' perceived warmth (DiDonato & Jakubiak, 2016), purchasers of green products were viewed as more generous than purchasers of conventional products. Regarding perceived wealth, results also supported predictions, with purchases of more expensive products leading to perceptions of greater wealth than purchases of less expensive ones. Results also revealed an unexpected effect of product greenness on ratings of wealth. In particular, purchasing green products increased the perceived wealth of male purchasers. In contrast, perceived wealth ratings of female purchasers were not influenced by product greenness. One potential explanation for this result might be that green products – and more generally, sustainable behavior (Hardy

Table 6
Hierarchical regression analyses of predictors of part worth scores of product greenness, and predictors of part worth scores of product price.

Predictor	Part worth scores of product greenness				Part worth scores of product price			
	Step 1	Step 2	Step 3	Step 4	Step 1	Step 2	Step 3	Step 4
SOI	-.001	.003	.003	.05	-.05	-.06	-.06	-.10*
Motive	.006	.004	.006	.01	.04	.04	.04	.03
Sex	.19***	.19***	.19***	.20***	-.05	-.05	-.05	-.03
SOI x Motive		.004	.004	.004		-.03	-.03	-.04
SOI x Sex		.03	.03	.03		-.01	-.01	-.01
Motive x Sex		-.07	-.07	-.07		.01	.007	.007
SOI x Motive x Sex			.009	.01			-.02	-.03
Honest-Humility				.20***				-.14**
Conscientiousness				-.005				-.04
Agreeableness				.05				.04
R^2	.03	.04	.04	.09	.006	.008	.009	.03
ΔF	7.71***	1.21	.04	10.59***	1.25	.36	.41	4.78**

Sex is coded 0 = male. 1 = female; Motive is coded 0 = control, 1 = mating; Higher scores in SOI indicate a more sexually unrestricted orientation. Standardized regression coefficients are presented.
*$p < .05$, **$p < .005$, ***$p < .001$.

& van Vugt, 2006; Van Vug & Hardy, 2009), do not only signal prosocial tendencies, but also status (Braun Kohlová & Urban, 2020), and previous research has shown that status tends to be associated with perceptions of wealth (Nelissen & Meijers, 2011). Alternatively, given that green products are generally more expensive that their non-green counterparts, participants might have inferred that green purchasers were wealthy even if the purchased products were not described as being expensive.

Regarding purchasers' desirability as short and long-term mates, results partially supported predictions. Purchasers of sustainable products were rated as more desirable long-term partners than purchasers of conventional products, regardless of their sex. This result is aligned with previous literature indicating that both sexes value indicators of prosociality in potential long-term mates (Arnocky et al., 2017; Barclay, 2010; Bhogal et al., 2019; Farrelly, Clemson, & Guthrie, 2016; Farrelly & King, 2019). Further, it is consistent with the notion that preferences for altruistic traits evolved via mutual mate choice (Stewart-Williams & Thomas, 2013), and that differences in parental investment among humans are likely to be relatively smaller (due to human pair bonding, and biparental care), compared to those found in other species.

That being said, results also showed that green purchasers were rated as more desirable short-term partners than purchasers of conventional products, though the effect was smaller than the one observed for long-term desirability. Two possible (and not mutually exclusive) explanations for this effect might be that prosociality and generosity are also valuable even in the context of short-term relations, perhaps especially for men (Arnocky et al., 2017; Barclay, 2010). Alternatively, short-term mating can be used to initiate a long-term pair bond (thus, a prosocial short-term mate could eventually become a long-term one). Indeed, although previous studies have shown that altruistic targets are rated as more attractive for long-term relationships relative to short-term ones (Farrelly et al., 2016; Farrelly & King, 2019), specific comparisons between the attractiveness of altruists and non-altruists within each relationship type are usually not provided. In other words, it might be that people, if given the choice, prefer prosocial partners compared to non-prosocial partners for a short-term relationship, but this preference is not as strong as that observed for long-term relationships. Indeed, recent research suggests that perceptions of someone's warmth and trustworthiness predicts initial attraction to potential partners in live mating contexts such as speed dating events (Valentine, Li, Meltzer, & Tsai, 2020). Thus, it seems that generosity might be also a valuable trait even in the context of short-term relations.

Women were rated as more desirable as long-term mates if they bought relatively less expensive products in our studies. This result aligns with other work suggesting that savers tend to be more desirable than spenders as long-term partners primarily because they are perceived as having higher self-control (Olson & Rick, 2014). Indeed, one direct replication of Sundie et al.'s (2011) Study 4 indicated that male and female Honda buyers (savers) were more desirable than ostensible Porsche buyers (spenders) for a long-term relationship (Olson & Rick, 2014). Another possible explanation might be that product price – apart from signaling wealth – could also be used as an indication of how loyal a person might be. Due to differential parental investment, men on average care more than women about sexual fidelity (Bjorklund & Shackelford, 1999), and they should therefore be especially sensitive to cues that indicate sexual loyalty. Some research suggests that consumption types might be linked to perceptions of loyalty. Indeed, women tend to rate other women who consume luxuries as more attractive, flirty, young, ambitious, mature, smart, sexy, and less loyal (Hudders, de Backer, Fisher, & Vyncke, 2014). To our knowledge, however, no study has tested whether these perceptions are the same when men evaluate women.

Although findings of Study 1 did not align with those reported by Sundie's et al. (2011), with conspicuous consumption failing to enhance male purchasers' attractiveness as short-term partners, they converged in terms of the effects of purchase decisions on men's perceived SOI. In particular, while men were perceived as more sociosexually unrestricted if they bought more expensive products, women's perceived sociosexual orientation was not affected by product price. Moreover, findings extended this previous work by showing that men (but not women) purchasing conventional products (instead of green ones) were perceived as more sexually unrestricted. These findings support the idea that product purchases have communicative value, acting as a costly signal, at least when it comes to mating.

Regarding Study 2, results were largely inconsistent with predictions. Although women preferred green products more than men did, and sociosexually unrestricted individuals preferred cheaper products more than sociosexually restricted ones, none of the predicted interactions between mating motives, sociosexuality, and participant sex emerged. As mentioned earlier, women showing higher preferences for sustainable products seems consistent with literature on sex differences on environmental demographics (Arnocky & Stroink, 2010; Zelezny et al., 2000). Regarding the negative influence of SOI on preferences for product price, results seems to be inconsistent with previous research indicating that sociosexually unrestricted men tend to engage in conspicuous consumption, especially when mating motives are salient (Sundie et al., 2011). Instead, results suggest that sociosexually unrestricted men and women tend to evaluate expensive products more negatively, regardless of mating motive salience. These findings could be understood by contrasting them with previous work on the appeal of savers as long-term relationship partners (Olson & Rick, 2014). In other words, if sociosexuality is expected to influence the mating signal sent to potential partners (e.g., whether you are interested in a short-term or long-term relation), sociosexually unrestricted individuals should avoid sending the "wrong message" and show greater preference for relatively less expensive products rather than expensive ones (that could signal they are looking for a long-term partner, instead of something more casual). In any case, given the lack of support for our primary predictions, these results should be taken with caution, and future developments should investigate whether they replicate.

Overall, findings from both studies build on previous research on the social, communicative, and status-related motives behind sustainable consumption (Dagher & Itani, 2014; Oliver & Lee, 2010). Specifically, they add to the literature on green marketing and sustainable purchasing (for a review see Groening, Sarkis, & Zhu, 2018), and suggest that consumers of sustainable (vs. conventional) products are perceived differently by opposite-sex partners, increasing their attractiveness as long – and to a lesser extent – short-term partners. Moreover, men who purchase conventional (versus sustainable) products, and relatively more expensive (versus relatively less expensive) products are perceived as more sexually unrestricted by women (Study 1). However, we do not find that actors' product preferences strategically vary in response to certain contextual cues (Study 2) as men's sociosexuality did not influence their product preferences, even when mating motives were salient.

This mixed pattern of results is consistent with recent work indicating that, although pro-environmentalists are expected to behave more cooperatively in social dilemmas, and tend to elicit more cooperative behaviors in such games, they are in reality no more cooperative than other individuals (Vesely, Klöckner, & Brick, 2019). One possible explanation is the visibility of cooperative actions. Pro-environmentalists might act accordingly only when pro-social acts are made publicly rather than in private. This alternative explanation might also help to understand why the findings from Study 2 failed to support the main predictions. Thus, it could be that sociosexuality relates to consumer decisions only when these choices are perceived as a mating signal. In other words, sociosexuality might affect product purchases only when potential (available) partners are observing. Future studies could explore this idea further via field studies where the consumer is being watched by potential opposite-sex partners.

8.1. Limitations and future directions

Our studies are not exempt of limitations. First, although Study 1 solved some of the methodological shortcomings seen in previous research (e.g., presenting participants with actual pictures of potential partners), it still relied on fictitious purchase scenarios, and therefore they might not necessarily reflect actual mate preferences in real life events. Future studies could build from the present results and test whether they replicate in a more ecologically valid setting such as speed-dating events (Finkel, Eastwick, & Matthews, 2007). Second, our studies focused on the communicative properties of purchase decisions; particularly on communicative signals aimed at opposite-sex individuals. We did not explore the value of purchase decisions as signals in the context of intrasexual competition. Thus, following previous research on conspicuous consumption and intrasexual competition and mate guarding among women (Hudders et al., 2014), and men (Hennighausen, Hudders, Lange, & Fink, 2016), future developments could further explore whether purchasing "pro-social" products (e.g., sustainable products) might be beneficial in same-sex signaling contexts. Third, although we controlled for potentially relevant personality variables (i.e., honesty-humility, conscientiousness, and agreeableness) in Study 2, we did not take into account individuals' average income, which might shape perceptions of product affordability. Future developments should explore whether personal income serves as an anchor that people use to evaluate how expensive a product is, and whether this affects their consumer preferences. Lastly, and taking in consideration the recent discussions on the effect sizes associated to priming mating motives on consumer behavior (Shanks et al., 2015; Shanks & Vadillo, 2019), future studies should better validate priming manipulations such as that used in Study 2, perhaps by including manipulation checks.

9. Conclusion

In sum, the current findings indicate that consumption of sustainable products increases one's attractiveness as a long-term romantic partner, but also as a short-term partner, and that women perceive men who purchase sustainable products as more sociosexually restricted than men who purchase conventional products. These perceptions, however, are not necessarily accurate, and do not correspond with actual consumption preferences of people varying in mating investment.

Ethics review

The experimental procedures of both studies presented in this paper were approved by an Ethics Review Board. Faculty and University name of this Board are purposely omitted here to maintain the anonymity of the authors and will be fully disclosed after the revision process.

Author statement

Gonzalo Palomo-Vélez: Conceptualization, data curation, formal analysis, writing- Original draft preparation. **Joshua M. Tybur**: Supervision, Methodology, Writing- Reviewing and Editing. **Mark van Vugt**: Supervision, Methodology, Writing- Reviewing and Editing.

Declaration of competing interest

There is no potential conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2020.101530.

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